

## REMARKS

Applicants reply to the Notice of Non-Compliant Amendment dated May 24, 2005, in which this Reply is filed within the shortened one month period of reply. Claims 1-9 were pending in the original application and the Examiner rejects claims 1-9. Applicants cancel original claims 1-9 and add new claims 10-29.

Applicants thank the Examiner for outlining the Office's guidelines, and pursuant to the Examiner's suggestions, Applicants have obtained patent counsel to further prosecute this application.

The Examiner rejects claim 1-9 under 35 U.S.C. § 112 because the claims include indefinite and narrative language. To expedite prosecution of the application, Applicants cancel claims 1-9 without prejudice to file claims with similar subject matter. Applicants also add new claims 10-29 in proper format which are sufficiently supported in the original specification and claims. No new matter is added by these amendments.

The Examiner objects to the disclosure and abstract for various informalities. To expedite prosecution of the application, Applicants substantially amend the specification and abstract. Applicants also clarify the limitations in the specification with the drawing figures and reference numbers. For the Examiner's convenience, Applicants submit a substitute specification (Exhibit A) and substitute drawings (Exhibit B), along with a redlined version showing the changes to the specification (Exhibit C) and red pen markings showing the changes to the drawings (Exhibit D).

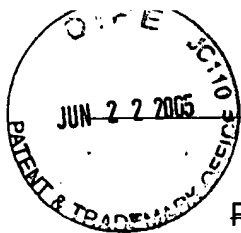
No new matter is added by these amendments. Reconsideration of this application is respectfully requested. Applicants authorize and respectfully request that any fees due be charged to Deposit Account No. 19-2814, including any required extension fees.

Respectfully submitted,

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Patent Application of Title: VEHICLE MOUNTED COMBINATION TRUNK-  
WORKBENCH WITH VARIABLE HEIGHT ADJUSTMENT

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For

CROSS-REFERENCE TO RELATED APPLICATION

[0001] TITLE: This application claims priority to, and the benefit of, U.S. Serial No. 10/771,799 filed February 4, 2004 and entitled "Sliding, Portable, Vehicle Mounted Combination Trunk-Workbench with Variable Height Adjustment", which itself claims priority to U.S. Provisional Application Serial No. 60/445,541 filed February 6, 2003, both of which are hereby incorporated by reference.

CROSS REFERENCE TO RELATED APPLICATIONS

60/445,541 filed 02/06/2003

FEDERALLY SPONSORED RESEARCH Not Applicable

SEQUENCE LISTING OR PROGRAM Not Applicable

BACKGROUNDFIELD OF THE INVENTION FIELD OF INVENTION

[0002] ThisThe present invention relates togenerally to a combination storage and workbench devicesdevice, and more particularly, to a storage cabinet that can be mounted and utilized in the beds of trucksremovably affixed within the bed of a truck or similar vehicles, and easily accessed, removed and transportedvehicle.

BACKGROUND OF THE INVENTION

[0003] The cargo carrying area of a pickup truck, van, sport utility or similar vehicle is often referred to as the "bed". Many instances of beds have intruding wheel wells at some point along their length. The present invention relates to an enclosed, compact, organized, storage cabinet installed in such a bed that readily becomes a

~~portable, mobile workbench. During certain types of transport it is desirable to include a storage container in a vehicle's bed. The storage container serves to retain, for example, tools, equipment, supplies, groceries or other items so as to allow the user of the vehicle to have ready access to those items at the destination. Hereafter the storage container shall be referred to as a toolbox to which ready and convenient access is necessary or desirable. A bed mounted toolbox represents one such storage container.~~

[0004] ~~Unfortunately, many available~~ Many of the prior art bed-mounted toolboxes in beds are ~~are inconveniently positioned in poor locations. For example, some toolboxes require leaning over the sides of pickup trucks to see the contents, much less to lift them out and use them. Some toolboxes are in fixed positions mounted on the side panels in pickup trucks and are also difficult to access. Some toolboxes are mounted on the side panels in pickup trucks and can slide along the length of side panels, however, they remain difficult to access due to their height and the need to reach over the tailgate or side panels of the bed. Additionally, very few of the toolboxes are mobile in a simple fashion once they are removed from the vehicle, and they do not provide mobile workbench functions. For example, the positioning of some toolboxes requires the user to lean over the sides of a truck bed to obtain a complete view of the contents. This design also makes it more difficult for items to be removed from the toolbox. Various configurations of prior-art toolboxes are described herein.~~

#### ~~BACKGROUND OF THE INVENTION - PRIOR ART~~

~~Various patents have been issued in the past that have described a variety of bed mounted storage containers or toolboxes, and various patents have been issued for combined toolboxes and workbenches.~~

[0005] ~~Early truck mounted toolboxes for example, in U.S. patents~~ U.S. Patent 4,488,669 (1984) to Waters, U.S. Patent 4,531,774 (1985) to Whatley, and U.S. Patent 4,967,944 (1990) to Waters, although ~~each disclose varying configurations and materials, were mounted on the side panels of side-mounted toolboxes. The disclosed toolboxes are permanently attached~~ affixed to the vehicle,

bed side panels and are also difficult to access, and are not automatically closed when the vehicle's tailgate is up. These devices~~Side-mounted toolboxes~~ have the additional disadvantage of ~~protruding over~~extending beyond the side panels, effectively eliminating the vehicle's capability of supporting bed toppers, and frequently adding to the ~~exterior size~~overall width of the vehicle.

[0006] ~~Other early truck-mounted toolboxes — for example, in U.S. patent 4,283,083 (1981) to Johnson, mounted an enclosure on the inside of a tailgate. This design has several disadvantages: when loaded it adds weight to the tailgate, is very limited in size, irregular in shape, and permanently affixed to the vehicle.~~

[0007] ~~Thereafter, truck-mounted toolboxes —~~Another configuration of a side-mounted toolbox enables the toolbox to slide along rails which are affixed to the top or insides of the vehicle's side panels; however, they too are difficult to access due to their height and the need to reach over the vehicle's tailgate or vehicle side panels. Similar side-mounted configurations are disclosed in, for example, in U.S. patentsPatent 4,522,326 (1985) to Tuohy III, U.S. Patent 4,635,992 (1987) to Hamilton et al, 4,705,315 (1987), U.S. Patent 4,889,377 (1989) to Hughes, U.S. Patent 5,088,636 (1992) to Barajas, U.S. Patent 5,121,959 (1992) to King, U.S. Patent 6,464,277 (2002) to Wilding, U.S. Patent 6,460, 174 (2002) to Lance, and U.S. Patent 6,607,230 (20003) to Voves, maintained the same basic configuration as early designs, but added the feature of allowing the toolbox to slide along rails affixed to the top or insides of the side panels of the vehicle bed. These devices are difficult to access, and are not automatically enclosed when the tailgate is up. These devices have the additional. These devices also have the disadvantage of protruding over the side panels, extending beyond the vehicle's side panels, thus in most cases effectively eliminating the vehicle's capability of supporting toppers, and frequently adding to the exterior sizeoverall width of the vehicle.

[0008] In U.S. patent 6,264,083 (2001) Paulick et al, a set of wheels ~~was~~is mounted to the lower surface of a box which slides on rails mounted on the side panels. The addition of wheels allows the box to move when dismounted from the vehicle, but the aforementioned limitations of sliding systems still apply, and the box is limited in depth, as it must move over ~~the~~ the intruding wheel wells.

[0009]

In U.S. patent 5,588,722 (1999) to Parri, a sliding toolbox or drawer system is proposed. The primary innovation in ~~this system~~ Parri is that the mounting rails may be raised or lowered in fixed increments, whilst remaining within the confines of the vehicle bed. This system suffers from the aforementioned limitations of the other full length bed sliding systems, and requires significant effort to reconfigure the adjustable mounting rails.

[0010]

Several other methods for moveable truck mounted toolboxes ~~for~~ For example, in U.S. patent 5,398,987 (1995) Sturgis, an external box is affixed to a side panel inside the bed and the internal enclosure rotates out towards the rear of the bed. The disadvantages of this method are limited size, the permanently mounted stationary enclosure, and the difficult access reaching over the tailgate. In U.S. 6,015,177 (2000) to Tijerina, a toolbox is mounted on rails attached to the inner walls of the side panels that angle up and over the wheel arches. The disadvantages of this method are difficulty in accessing the enclosure, difficulty lifting the enclosure over the wheel arches, and the non-automatic closure of the enclosure in its normal travel position. In U.S. 6,203,087 (2001) and 6,422,629 (2002) both to Lance et al, rear or front floor-mounted enclosures that are removable are proposed. The disadvantages of these proposals are the limited size of the enclosure, limited utility of the enclosure, and in the front mounted case, the difficulty of access. In U.S. 6,253,976 (2001) to Coleman et al, a side panel mounted sliding and rotating enclosure is proposed. The disadvantages of this proposal are the difficulty is accessing the enclosure, and intrusion of the rail system on other bed uses. In U.S. 6,354,647 (2002) to Voves, and 6,464,274 (2002) to Mink et al, sliding systems mounted to the floor of the bed are proposed. The disadvantages of these systems are they prevent using the bed for any other purposes, and the enclosure is not readily portable.

[0011]

In U.S. 5,992,719 (1999) to Carter III, an adjustable size storage enclosure that locks into the vehicle sidewalls is proposed. The primary innovation of this proposal is the ability to resize the internal enclosure by manually sliding the upper surface along brackets and then inserting retaining pins to hold it in place. The

disadvantages of this system are its fixed mounting system, and the method of resizing the container.

**[0012]** In U.S. 4,946,215 (1990) to Taylor, a storage device is proposed that fits into a portion of a truck bed and locks into place with a positioning and suction cup apparatus. The storage device can be removed by unlocking it, and it is portable. The disadvantages of this proposal are that it consumes the entire rear bed space, is not readily portable when loaded, and is difficult to access when in place.

**[0013]** Combination toolbox and workbenches are also known—~~for~~. For example, in U.S. 4,369,822 (1983) to Rice, in U.S. 4,733,703 (1988) to Cimino, and 5,725,037 (1998) to Faulhaber, rolling workbench and toolbox combinations are proposed. The disadvantages of these proposals are they are not vehicle-mount ready, they have fixed size configurations, and limited ground clearance is provided.

**[0014]** Several methods have been proposed for lifting toolboxes or similar enclosures—~~for~~. For example, in U.S. 5,890,866 (1999) to Scheibel, a self-loading transporter is proposed. The primary objective of this device is moving, loading, and lifting a container into a vehicle. The disadvantages of this proposal are that it does not provide an anchored and ready access toolbox when in the vehicle, it does not provide workbench capabilities, and it prevents other uses of the bed when loaded. In U.S. 6,615, 973 (2003) to Fritter, a toolbox loading and unloading cart is proposed. The disadvantages of this proposal are that it has a fixed height, it does not provide toolbox or workbench capabilities, and it is not firmly affixed to the vehicle when loaded. In U.S. 4,936,624 (1990) to West, and 5,303,969 (1994) to Simnacher, permanently fixed systems are proposed for hydraulically lifting a toolbox within the confines of a vehicle. The disadvantages of these proposals are the permanence of the hydraulic systems, the difficulty of accessing the contents over the side panels, the limited functionality of the toolboxes, and the general complexity and cost of the hydraulics. In U.S. 2004/0207226 (2004) to Johnson, a truck storage and work surface tailgate is proposed. The unit is fixedly mounted attached to the tailgate, with a powered mechanism for extending and then lowering or raising the entire unit and vertically mounted tailgate to or from the

ground. The disadvantages of this system are the space it consumes in the back of the truck bed, its lack of a true workbench surface, and its lack of accessibility while mounted.

[0015] In U.S. 5,964,492 (1999) to Lyon, a stowage receptacle is proposed for the rear area of a pickup truck bed. This unit mounts on slide rails in the bed, and slides out over the tailgate. The disadvantages of this system are its lack of workbench capabilities, its limited mobility when dismounted, the inability to raise or lower it, and limitation in weight carrying capacity because all of its weight must be supported by the slide rails.

[0016] ~~All of the vehicle mounted toolbox systems heretofore known suffer from some combination of the following disadvantages:~~

- ~~(a) The toolboxes as described are not readily portable after being removed from the vehicle at a destination or jobsite.~~
- ~~(b) The toolboxes as described are not readily reconfigurable to the proper height for workbench uses.~~
- ~~(c) The toolboxes as described do not provide workbench capabilities.~~
- ~~(d) The mounting systems within the vehicles do not allow for the use of the side panel rails for other normal purposes.~~
- ~~(e) The mounting systems within the vehicles do not allow for the use of the main bed for other normal purposes.~~
- ~~(f) Access to the contents of the toolboxes is difficult by virtue of mounting position, height, or reach.~~

[0017] (g) The All of the vehicle mounted toolbox systems are heretofore known suffer from some combination of the following disadvantages which include not being readily portable after being removed from the vehicle at a destination or jobsite, not readily reconfigurable to the proper height for workbench uses, do not provide workbench capabilities, do not allow for the use of the side panel rails for other normal purposes, do not allow for the use of the main bed for other normal purposes, inconvenient access to the contents of the toolboxes by virtue of mounting position, height, or reach and locking mechanism and subsequently the

contents of the toolbox are not protected from tampering when the tailgate is closed.

## ~~BACKGROUND OF THE INVENTION — OBJECTS AND ADVANTAGES~~

~~The objects and advantages of the present invention hereafter referred to as the truck bench are:~~

- ~~(a) to provide a vehicle mounted toolbox that allows for convenient and easy access while mounted in the bed of a vehicle;~~
- ~~(b) to provide a vehicle mounted toolbox that slides out over the tailgate of said vehicle;~~
- ~~(c) to provide a vehicle mounted toolbox that is easily detached from said vehicle;~~
- ~~(d) to provide a vehicle mounted toolbox that functions as a workbench;~~
- ~~(e) to provide a vehicle mounted toolbox that is easily transportable;~~
- ~~(f) to provide a vehicle mounted toolbox that functions as a rolling standalone toolbox when detached from said vehicle;~~
- ~~(g) to provide a vehicle mounted workbench whose height can be easily and variably adjusted;~~
- ~~(h) to provide a vehicle mounted toolbox capable of effectively containing significant weight while providing the other noted features;~~
- ~~(i) to provide a vehicle mounted toolbox that is protected from tampering when the tailgate is closed;~~
- ~~(j) to provide a vehicle mounted toolbox that includes a safety system to prevent sudden movement of said toolbox;~~
- ~~(k) to provide a vehicle mounted toolbox that easily locks securely into place in said vehicle bed;~~
- ~~(l) to provide a vehicle mounted toolbox that can be internally reconfigured for multiple functions.~~



## SUMMARY

### SUMMARY OF THE INVENTION

**[0018]** To overcome the limitations in the prior art described above, and to overcome other limitations that will become apparent upon reading and understanding the present specification, hereinafter referred to as a "trunk-bench", the present invention is an improved device for storing objects and providing a workbench. While the way in which such a device can be configured and may be used to address the foregoing disadvantages will be described in greater detail hereinbelow, in general, when engaged within a vehicle bed, the trunk-bench can be moved and removed.

**[0019]** The~~In accordance with an exemplary embodiment of the present invention is a storage cabinet sized to be capable of being,~~ the trunk-bench is suitably sized in order that it may be mounted to a rear floor portion of a vehicle having juxtaposed vehicle side panels spaced apart by a predetermined first distance, juxtaposed wheel wells each having a portion that extends outwardly from its respective side panel, and a rear vehicle tailgate that is ~~pivotably~~pivotally moveable between a closed position and an open position. The tailgate being spaced from the rear portion of the wheel wells by a predetermined second distance and having a predetermined length of a third distance and a predetermined height approximately equivalent to that of the side panels of a fourth distance.

**[0020]** The storage unit comprises a cabinet having a length not greater than the third distance, a depth not greater than the second distance, with no portion of the cabinet extending outside of a space bounded by a vertical plane coinciding with the rear portion of the wheel well, and a second vertical plane coinciding with the interior portion of the tailgate when the tailgate is in its closed position, and a height, in its normal position, not greater than a plane defining the top surfaces of the side panels.

**[0021]** The cabinet ~~also~~ comprises a ~~pivotably~~pivotally moveable hinged upper surface firmly attached to the rear vertical member of the cabinet that extends laterally beyond the vertical side members of the cabinet with a total length no

greater than the third distance, a width no greater than the second distance, and has pneumatic or similar struts to support it in a variety of open positions.

**[0022]** The cabinet also comprises a center storage section with a plurality of removable central dividers, ~~pivotably~~pivotally movable doors revealing the interior of the cabinet, and a plurality of drawers disposed in the bottom portion of the cabinet in a side-by-side fashion. Each of the drawers has a predetermined depth that will fit inside the interior of the cabinet and that is less than the second distance, and a width that is not greater than one half the length of the lower section of the cabinet. The cabinet also comprises a plurality of drawer support members that support the drawers so that the drawers can slide back and forth in a direction parallel to the length of the cabinet.

**[0023]** ~~The~~Moreover, the cabinet ~~also~~ comprises a plurality of variably adjustable height mechanisms and wheel assemblies each comprising at least one cylinder, height adjustment actuator, wheel platform, and guide rods. The cylinders are enclosed and firmly attached at one end to the interior of the cabinet and at the other end to the wheel platform. The cylinders are positioned towards the ends of the cabinet, and move in a vertical direction, perpendicular to the length of the cabinet. The cylinders may have a variable pressure adjustment system to vary the amount of force they can apply when raising or lowering the storage unit. The cylinder actuators are integrated into the cabinet and activate the height adjustment mechanism by depressing a pressure release button mounted in the upper end of each cylinder.

**[0024]** The wheel platforms each comprise a horizontal platform that is sized to fit in cutouts in the bottom portion of the cabinet and each has a plurality of fully articulating caster wheels firmly attached to the lower surface of the platform. Each of the wheels may have a locking mechanism to prevent or allow rolling.

**[0025]** There is a plurality of guide rods for each wheel platform, firmly attached to the upper surface of the wheel platform, and mounted parallel to the cylinders. Each guide rod slides vertically in and out of a corresponding guide hole in the body of the housing for the cylinder wheel assemblies.

[0026]

The storage unit also has a plurality of retention members, at least one on each side, firmly affixed to the vehicle. The retention members comprise brackets securely attached to the floor of the bed or side panels of the vehicle in the defined space and not to exceed the first, second, or fourth dimensions. The retention members also comprise cabinet support slides that partially support and guide the cabinet and allow the cabinet to move in a direction parallel to the length of the bed between a stored position where no portion extends beyond a vertical plane defined by the interior surface of the tailgate in its closed position, and an extended position when the cabinet is positioned over the extent of the tailgate in its open position. The retention members also comprise a retention belt system. The rolling belt retractor is mounted on one of the retention members and the buckle fastener mounted on the paired retention member. The rolling belt threads through a firmly attached ring mounted on any one or more vertical surfaces of the cabinet.

[0027]

In various embodiments, the invention includes a vehicle mounted trunk-bench that allows for convenient and easy access while mounted in the bed of a vehicle, slides out over the tailgate of said vehicle, is easily detached from said vehicle, functions as a workbench, is easily transportable, functions as a rolling standalone trunk-bench when detached from the vehicle, with a height that can be easily and variably adjusted, is capable of effectively containing significant weight while providing the other noted features, is protected from tampering when the tailgate is closed, includes a safety system to prevent sudden movement of said trunk-bench, easily locks securely into place in said vehicle bed and can be internally reconfigured for multiple functions.

[0028]

The features and advantages of the present invention will be apparent to those of ordinary skill in the art in view of the detailed description of the preferred embodiments, which are made with reference to the drawings, a brief description of which is provided below.

#### DRAWINGS—FIGURES BRIEF DESCRIPTION OF THE DRAWINGS

[0029]

The above objects and advantages of the present invention will become more apparent by describing in detail preferred embodiments thereof with reference to the attached drawings in which:

[0030] FIGFigure 1 is a partial cutaway view from above and in front of the trunk-bench as it would be mounted in the bed of a pickup truck; in accordance with an exemplary embodiment of the present invention;

[0031] FIGFigure 2 is a perspective view of the standalone trunk-bench ~~showing~~illustrating the configuration and basic inner workings; of the truck-bench in accordance with an exemplary embodiment of the present invention;

[0032] FIGFigure 3 is a perspective view of the mounting brackets and support slides used to mount ~~the an~~ trunk-bench in a vehicle; bed in accordance with an exemplary embodiment of the present invention;

[0033] FIGFigure 4 is a perspective ~~detail drawing of the an~~ internal cylinder mechanism, ~~internal to the trunk-bench~~ that is used to raise and lower the trunk-bench, ~~and details of the wheel platform;~~ in accordance with an exemplary embodiment of the present invention;

[0034] FIGFigure 5 is a perspective detail drawing of the cylinder activating handle mechanism; in accordance with an exemplary embodiment of the present invention;

[0035] FIGFigure 6 is a perspective detail drawing of the lower locking mechanism that is used to secure the box to the support slides and prevent the lower drawers from being opened; in accordance with an exemplary embodiment of the present invention;

[0036] FIGFigure 7A is an elevation drawing ~~of an alternative~~illustrating method for implementing the support slides; in accordance with an alternative embodiment of the present invention;

[0037] FIGFigure 7B is an orthogonal view of the alternative ~~shown~~embodiment illustrated in FIGFigure 7A; and,

[0038] FIGFigure 8 is an elevation drawing of ~~an alternative to the front of the trunk-bench~~ showing hinged front opening panels in accordance with an alternative embodiment of the present invention.

[0039]

DRAWINGS—Reference Numerals

10	side panels	41	floor
12	tailgate	44	cabinet
16	lid	48	mounting brackets
20	wheel platforms	22	lower support slides
24	upper support slides	26	lock cylinder/shaft
28	left locking rod	30	right locking rod
32	retention belt	34	quick release latch
36	D-ring	38	retention belt retractor
40	hand holds	48	lid struts
50	cylinders	52	guide rods
54	actuator arms	62	caster wheels
64	lockable release handle	90	locking holes

#### ~~DETAILED DESCRIPTION—FIGS. 1—8—PREFERRED EMBODIMENT~~

[0040] In the following description of the exemplary embodiment, reference is made to the accompanying drawings, which form a part hereof, and in which is shown by way of illustration the specific embodiment in which the invention may be practiced. It is to be understood that other embodiments may be utilized as structural and/or design changes may be made without departing from the scope of the present invention.

[0041] A trunk-bench, as used herein, may include any storage unit suitably configured to be placed in the bed of a vehicle. A trunk-bench may comprise, for example, storage bins, cabinets, drawers and the like. Practitioners however, will appreciate that the present invention may also be employed in any number of other applications for which a need exists for storage space.

[0042] With reference to the appended drawings, Figures 1-8, it should be noted that these drawings are exemplary in nature wherein like reference numerals designate like parts as referred to in the following preferred embodiments, and which in no way serve to limit the scope of the invention.

[0043] Referring more particularly to the drawings, a preferred embodiment of the present invention is shown in FIG 1 (perspective cutaway). Figure 1 is a partial

cutaway view from above and in front of an exemplary trunk-bench as it would be mounted in the bed of a pickup truck-bed. The body of the cabinet 14 is constructed of a sturdy material such as a durable plastic, aluminum-~~or~~, light gauge steel with ~~appropriate internal bracing.~~ It fits and the like. Cabinet 14 is dimensioned to be received within the vehicle side panels 10, and is attached to mounting brackets 18 (shown in more detail in FIG 3) on each side using a plurality of heavy duty slides 22 lower, and 24 upper, on each side. ~~The mounting~~ Mounting brackets 18 are securely attached to the base of pickup bed 11 that has both vertical side panels 10 and a pivotably pivotally hinged tailgate 12. The drawer slides support the cabinet 14 and allow the entire unit 14 to slide out over the tailgate 12 (as indicated by the arrows) while in a lowered position.

[0044] The lid 16 of ~~the cabinet 14~~ has a top surface that is smooth and flat with etched or marked vertical 44 and horizontal 42 scales, The scales may be used for aligning and measuring various items or materials. ~~Lid 16~~ Lid 16 also has a plurality of handholds 40, shown as one on each side, that are used to facilitate moving the cabinet 14 while in use. ~~The~~ In a preferred embodiment, the upper surface of lid 16 would ideally be made constructed of a non-abrasive, dent resistant metal such as, for example, stainless steel securely affixed to the main body of the lid. More details of the standalone cabinet and lid are shown in FIG. The lid 14 will be discussed in greater detail in reference to figure 2.

[0045] Figure 4 is a perspective of an internal cylinder mechanism that is used to raise and lower the trunk-bench in accordance with an exemplary embodiment of the present invention. The wheel platforms 20 are permanently and securely attached to the cylinder and guide rods mounted inside the trunk-bench. The wheel platforms 20 are raised and lowered by adjusting the position of the actuator arms 54. They are also attached to a plurality of lockable wheels 62 securely mounted on the outside lower surface of each wheel platform 20.

[0046] ~~The wheel platforms 20 are permanently and securely attached to the cylinder and guide rods (shown in more detail in FIG 4) mounted inside the trunk-bench. The wheel platforms are raised and lowered by moving the actuator arms 54. They are also attached to a plurality of lockable, caster wheels 62 securely~~

~~mounted on the lower surface of each wheel platform 20 towards the ends.~~  
~~The~~With reference to Figure. 1, wheels 62 extend below the lowest surface of the trunk-bench when the cabinet 14 is fully lowered to allow access to a space having a predetermined vertical height for a variety of items ~~(as shown in FIG 1)~~. To assist with aligning ~~the~~ cabinet 14 on the slider/rails 22, 24 as it is being installed, the wheels 62 rest on the surface of the alignment ramps 46. ~~The alignment~~Alignment ramps 46 may be free standing as shown, or ~~pivotal~~pivotally attached by a flat hinge to the base of ~~the~~ mounting brackets 18 and fit into or over the pickup bed 11 grooves and extend outward over the tailgate 12. ~~The~~In an embodiment, the alignment ramps are ~~made~~constructed of a ~~suitable~~, durable and slightly rough substance to provide ~~some~~ rolling friction.

[0047] Figure 3 is a perspective view of the mounting brackets and support slides used to mount a trunk-bench in a vehicle bed in accordance with an exemplary embodiment of the present invention. At the rear of ~~the~~ cabinet 14 is a retaining belt 32, similar to a seatbelt, that runs through a retaining D-ring 36 that is securely attached to one or more vertical surfaces of the cabinet- 14. One end of the belt is attached to a belt retractor 38 that is securely mounted on the right side mounting bracket 18. The other end of the belt has a durable buckle 35 that plugs into the quick release connector 34. The quick release connector 34 is securely mounted on the left side mounting bracket 18. ~~This arrangement is shown in more detail in FIG 3.~~

[0048] Figure 6 is a perspective detail drawing of the lower locking mechanism that is used to secure the box to the support slides and prevent the lower drawers from being opened in accordance with an exemplary embodiment of the present invention. The entire cabinet 14 can be locked into the slide rails 22 positioned on each side with ~~the~~ internally mounted locking rods 28, 30 and lock cylinder/shaft 26 ~~(shown in more detail in FIG 6)-~~26. The locking rods 28, 30 are actuated by the lock cylinder/shaft 26 in the front of the cabinet- 14. Additionally, the lower drawers 56 can be locked at the same time by the U-rod 108 ends engaging the locking holes 110. When it is in the locked position, this entire locking mechanism

prevents the cabinet 14 from sliding on the slide rails 22 and prevents the drawers from being opened. 56 opening unintentionally.

[0049]

~~The main cabinet 14~~ Figure 2 is a perspective view of the standalone trunk-bench-is shown in its dismounted and standalone configuration in FIG 2- illustrating the configuration and basic inner workings of the truck-bench in accordance with an exemplary embodiment of the present invention. The lid 16 has a hinge 66 that runs the entire length of the cabinet 14 and one or two small struts 48 that keep the lid 16 in a variable or fully raised position. Furthermore, ~~the lid 16~~ contains a small compressible gasket 77 of rubber or a similar substance, running along its perimeter that mates with the body of the ~~main cabinet. 14.~~ Note also that both ends 68 of ~~the lid 16~~ protrude over the edge of ~~the cabinet 14 by a predetermined distance sufficient to cover the slide mechanisms and to be used for workbench purposes (for clamping, sawing, drilling, etc.).~~ The lid 16 is latched with a plurality of lockable release handles 64. These Release handles 64 keep the lid 16 secure and along with the gasket 77 sealed against the elements. Lastly, a center removable panel 58 is shown in place. There may be a plurality of these panels 58 that can be removed to make a single long central storage area or moved to vary the size of several smaller ones storage area.

[0050]

~~FIG~~ Figure 2 also shows the motion of the various elements of the trunk-bench. ~~The wheels~~ Wheels 62 roll and pivot, and ~~the wheel locks 63~~ pivot to/from locked/unlocked positions. The wheel platforms 20 on both sides slide up and down, driven by the motion of ~~the cylinders 50.~~ Cylinders 50 move up and down respectively by raising or lowering the actuator handles 54. ~~The drawers~~ Drawers 56 slide in and out. ~~The and~~ lid 16 pivots open and closed along its hinge point 66. ~~Finally, the~~ With reference to Figure. 1, cabinet 14 slides in and out over the tailgate 12 on the slides/rails 22, 24 attached to the mounting brackets 18, and on the wheels 62 which rest on the alignment ramps 46.

[0051]

~~FIG 3 shows~~ Referring again to Figure 3, details of the left mounting bracket 18, which 18 are shown. The right mounting bracket is a mirror image of the ~~right~~ left mounting bracket ~~18 (18,~~ with the exception of the retractable retention belt hardware 34, ~~38).~~ 38. The mounting brackets are securely mounted to the floor of



the pickup bed using heavy duty bolts or may be welded in place. In FIG 3, ~~the~~ The body of the mounting bracket 18 is made of hard and durable material such as steel and has a plurality of supporting angle brackets 72 for rigidity. At the rear of ~~the mounting bracket 18~~ is a retaining ear 70 that prevents ~~the cabinet 14~~ from moving forward inadvertently or in case of an accident. ~~The retaining~~ Retaining ear 70 provides a mounting point for the quick release belt mechanism 34 and the other retaining ear ~~70~~ 71 on the opposing mounting bracket 18 provides a mounting point for the belt retractor 38. ~~The mounting~~ Mounting bracket 18 has ~~several~~ a number of tie-down holes 74 for general use with ropes or other fastening devices.

[0052]

FIG Figure 3 also shows one implementation embodiment of the slides. In this instance, ~~the upper slide 24~~ is in its fully retracted position and ~~the lower slide 22~~ is in its fully extended position. Drawer member 23 is the portion of ~~the slide 22~~ that is securely and permanently connected to the side of ~~the cabinet 14~~. ~~The~~ A slide stop ~~150~~ 152 prevents overextension of the slide. ~~When the 22.~~ With reference to Figure 6, when cabinet 14 is in its fully retracted position ~~the~~ a lock hole 90 in ~~the slide 22~~ aligns with ~~the locking rod 28~~. In the locked position, ~~the left locking rod 28~~ is fitted through ~~the lock hole 90~~ and into ~~the slide mechanism 22~~. In According to this implementation embodiment, the lower mounting surface 72 of the mounting bracket extends outward toward the bed side surface, ~~in.~~ In an alternative and preferred implementation embodiment, the lower mounting surface 72 extends inward toward the lateral center of the bed, and provides an extension of ~~the alignment ramps 46~~. (Figure 1, 46). In the alternative implementation, the alignment ramps (Figure 1, 46) are attached to the lower surface 72 of each respective mounting bracket 18 by hinges that allow the alignment ramps to pivotably (Figure 1, 46) to pivotaly move from a horizontal position to a vertical position.

[0053]

~~FIG 4 shows details of~~ Referring again to Figure 4, the right wheel platform and cylinder assembly 80 is shown mounted in the right side of the cabinet. ~~14.~~ The left side wheel platform and cylinder assembly 80 is a mirror image of the right side. ~~In this figure~~ As illustrated in Figure 4, the wheel platform 20 is extended approximately midway between the retracted and extended positions. ~~The cylinder~~

~~50 is permanently and securely affixed to the wheel platform 20 and to the upper support bracket 86. The actuator arm 54 is raised to depress the cylinder release button 55 and thereby extend, under no load, the cylinder or retract it, under a heavy load. To prevent the~~To prevent wheel platform 20 from twisting, guide rods ~~52,52~~ move up and down in the rod guides 53. ~~The rod~~Rod guides 53 are vertical holes drilled or formed in the guide mounting blocks 82, 84. Both guide rods 52 and the lower portion of ~~the cylinder 50~~ move vertically in appropriately sized holes through the housing of ~~the assembly 80~~. Similarly, the locking rod (Figure 6, 30) moves back and forth laterally through the locking rod hole 90 drilled horizontally through the front guide mounting block 82 and the lower support slide ~~22.~~ (Figure 6, 22).

[0054] ~~FIG 5 shows details of the actuator arm 54, the top of the cylinder 50, and~~Figure 5 is a perspective detail drawing of the cylinder activating handle mechanism in accordance with an exemplary embodiment of the present invention. The cylinder 50 is permanently and securely affixed to wheel platform (Figure 4, 20) and to the upper support bracket (Figure 4, 86). The actuator arm 54 is raised to depress the cylinder release button 55. The actuator arm 54 and thereby extend, under no load, cylinder 50 or retract it, under a heavy load. Actuator arm 54 mechanism pivots around the orthogonal arm, 94, depresses the cylinder release button, 55, and is securely mounted to the inside of the assembly (Figure 4, 80) using the mounting attachment 92.

[0055] ~~FIG 6 shows details of~~Referring again to Figure 6, the lower locking mechanism ~~that is illustrated which~~ secures the cabinet 14 by moving the locking rods 28,30 horizontally through the holes 90 in the guide mounting blocks and subsequently through the holes 90 in the lower slides 22. The locking mechanism simultaneously pushes the U-rod 108 and the U-rod ends through the locking holes 110 in the drawer assemblies 56. This action is accomplished by turning the mechanism of the lock cylinder/shaft 26 clockwise, which moves the lock actuator arm 100, and the lock cam 102. When ~~the pressure is released by turning the lock cylinder/shaft 26~~ counterclockwise, the cam 102 is forced up by the cam spring 106

exerting pressure on the U-rod plate 104 and thereby keeping the U-rod and locking rods retracted.

[0056] ~~FIG~~Figure 7A shows is an elevation views of drawing illustrating a method for implementing the support slides in accordance with an alternative to the mounting slides 22, 24. In this case, ~~two~~embodiment. Two parallel C-channels 120 are securely mounted on the body of ~~the~~ cabinet 14 using mounting ears 126. A set of T-roller wheels 124 rolls in the C-channels 120 and is supported by their shaft and bearing set 130. The bearing housing 122 is securely affixed to the mounting brackets 18. Each of the C-channels 120 has a quick release 123, end-stop 127 and inner/outer channels 125 similar to the slides ~~22, 24.~~ (Figure 2, 22, 24).

[0057] ~~FIG~~Figure 7B is an orthogonal view of the alternative ~~shown~~embodiment illustrated in FIGFigure 7A.

[0058] ~~FIG 8 shows a front elevation of the cabinet 14 with two hinged access doors 140. These doors have respectively~~Figure 8 is an elevation drawing of the front of the trunk-bench showing hinged front opening panels in accordance with an alternative embodiment of the present invention. The panels 140 have respective hinges 142 along the length of their outside edges. For security purposes, ~~they can~~panels 140 may only be opened after ~~the~~ lid 16 has been raised. Each ~~door~~panel 140 has friction locks on the lower center edges for positive locking and to assist in weather sealing.

~~Operation FIGS 1, 2, 3, 4, 6, 8~~

The described invention is mounted in the bed of a vehicle using mounting brackets ~~18~~. The cabinet ~~14~~ of the invention is attached to the mounting brackets using support slides ~~22, 24~~ that have steps at the fully in and fully out positions and may be locked in a variety of positions. The cabinet can be moved in a horizontal fashion for the full range of travel of the slides by pulling on the front of the cabinet or pushing on it. While in motion, the wheels ~~62~~ are normally in contact with the alignment ramps ~~46~~ and lower surfaces of the mounting brackets ~~72~~.

The cabinet ~~14~~ can be locked to the lower support slides ~~22~~, and the drawers ~~56~~ can be locked by turning the lock cylinder/shaft ~~26~~ clockwise  $\frac{1}{4}$  of a turn. This action extends the locking rods ~~28, 30~~ and the drawer locking U-rod ~~108~~ into the appropriate locking holes ~~90, 110~~.

The cabinet ~~14~~ can be detached from the support slides ~~22, 24~~ by sliding out the slide locks ~~152~~ and pulling on the cabinet until it reaches full travel, then releases from the slides. Similarly the cabinet can be re-attached to the support slides by aligning it with the support slides ~~22, 24~~ and pushing the cabinet onto the slides until it latches.

The cabinet ~~14~~ is raised by lifting both of the actuator handles ~~54~~, and letting the cylinders ~~50~~ push the cabinet up. Similarly, the cabinet can be lowered by lifting both of the actuator handles while simultaneously applying a downward force on the center of the cabinet.

The cabinet ~~14~~ can be secured with the retractable retention belt ~~32~~ by threading the belt through the D-ring ~~36~~ mounted on the rear surface of the cabinet, and inserting the buckle ~~35~~ into the quick release latch ~~34~~. The belt can be released by depressing the quick release latch button; it will subsequently retract.

The caster wheels ~~62~~ attached to the wheel platforms ~~20~~, can be locked to prevent rolling by depressing the wheel latches ~~63~~, and unlocked by reversing that motion.

~~Advantages~~

From the description above, a number of advantages of our invention become evident:  
(a) the position and shape of the entire trunk bench system allows for more truck bed utility than previous art;

- ~~(b) the ability to easily remove the cabinet from the mounting brackets allows for more truck bed utility than previous art;~~
- ~~(c) the ability to slide the cabinet out over the tailgate improves access to the contents;~~
- ~~(d) the ability to lock the cabinet to the support slides improves the security of the cabinet and its contents;~~
- ~~(e) the capabilities of the attached retention belt improve the safety of those persons traveling in the vehicle or who may be around the vehicle whilst it is en route;~~
- ~~(f) the over latch of the lid further improves the safety of the cabinet and its contents;~~
- ~~(g) the position of the cabinet between the wheel wheels and the tailgate, with the latching and locking mechanisms against the inside of the tailgate improves the security of the cabinet and its contents;~~
- ~~(h) the ability of the cabinet to be raised or lowered significantly improves its functionality and provides greater utility;~~
- ~~(i) the ability of the cabinet to be rolled about on its wheels both within the bed of the vehicle when not attached to its mounting brackets, and when dismounted from the vehicle improves its functionality and provides greater utility;~~
- ~~(j) the inherent overhang of the ends of the lid provides for more utility especially when used as a workbench;~~

#### ~~Conclusion, Ramifications, and Scope~~

~~Accordingly, the reader will see that the ability of this invention to slide in and out over the tailgate facilitates access to the contents of the cabinet. Further, the ability to easily dismount the cabinet from the bed, raise it to the normal working height of a workbench, and roll it about, further increases its utility. Other capabilities inherent in the design provide additional advantages in that:~~

- ~~• the mechanism for locking the cabinet to the support slides and simultaneously locking the internal drawers prevents access to the cabinet and its contents;~~
- ~~• the retaining belt feature prevents sudden untoward movement of the cabinet;~~
- ~~• the design of the lid with protruding ends and an integrated scale facilitates a variety of workbench functions including clamping, measuring, drilling, cutting, and joining;~~

• the positioning of the cabinet against the inner surface of the tailgate in its normally closed position and below the top surface of the side panels provides additional security for the cabinet and its contents by limiting access to the locks, drawers, and cabinet doors.

Modifications and alternative embodiments of the invention will be apparent to those skilled in the art given the previous description. For example: the cylinder actuators can be cable actuated and positioned differently; the number of guide rods and cylinders in each side varied or may be replaced by a screw type mechanism that can raise and lower the unit; the mounting brackets may be reversed such that the wheels of the unit rest on the lower mounting surface of the brackets; the alignment ramps may be pivotably attached to the lower surface of the mounting brackets so they bridge the normal gap between the tailgate and bed, and can be stored in a vertical position against the face of the cabinet when not in use; detachable saucer disks may be fitted to each wheel to facilitate sliding the cabinet across rough, soft or uneven terrain; the unit may be mounted in a different location in a vehicle or on an open back vehicle; etc. This description is to be construed as illustrative only, and is for the purpose of teaching those skilled in the art the best mode of carrying out the invention. The details of the structure and method may be varied substantially without departing from the spirit of the invention, and the exclusive use of all modifications that come within the scope of the appended claims is reserved.

[0059] The foregoing descriptions of the exemplary embodiments of the invention have been presented for the purposes of illustration and description. It is not intended to be exhaustive or to limit the invention to the precise form disclosed. Many modifications and variations are possible in light of the above teaching. It is intended that the scope of the invention be limited not with this detailed description, but rather by the claims appended hereto.

We claim:Claim:

10. (NEW) A cabinet system configured to be received within a vehicle bed, said cabinet system comprising:

a cabinet having a storage area, a first side and a second side;

a first bracket configured to movably mount to said first side of said cabinet;

a second bracket configured to movably mount to said second side of said cabinet; and,

an adjustable height device integral with said cabinet, wherein said adjustable height device at least one of raises and lowers said cabinet.

11. (NEW) The system of claim 10, wherein said first bracket is configured to mount near a first side of said vehicle bed and said second bracket is configured to mount near a second side of said vehicle bed.

12. (NEW) The system of claim 10, wherein said cabinet is constructed from at least one of plastic, aluminum and light gauge steel.

13. (NEW) The system of claim 10, wherein said cabinet comprises an upper surface having pneumatic struts configured to support said upper surface in a plurality of open positions.

14. (NEW) The system of claim 10, wherein said cabinet comprises an extended upper surface, said extended upper surface extending over at least one of said first side and said second side, thereby facilitating at least one of clamping, sawing, and drilling.

15. (NEW) The system of claim 10, wherein said cabinet comprises an upper surface having scales, wherein said scales comprise at least one of etched scales and marked scales.

16. (NEW) The system of claim 10, wherein said cabinet comprises an upper surface having at least one hand hold.

17. (NEW) The system of claim 10, wherein at least one of said first bracket and said second bracket is configured as L brackets.

18. (NEW) The system of claim 10, further comprising a retention belt system removably affixed to said vehicle bed and at least one of said first bracket and said second bracket.

19. (NEW) The system of claim 10, wherein at least one of said first bracket and said second bracket is configured with a ramp, said ramp configured to facilitate movement of said cabinet.

20. (NEW) The system of claim 10, wherein at least one of said first bracket and said second bracket is configured with a ramp, said ramp configured to facilitate movement of at least one wheel over said ramp, wherein said at least one wheel is mounted to said cabinet.

21. (NEW) The system of claim 10, wherein at least one of said first bracket and said second bracket is configured with a ramp pivotally attached to said at least one of said first bracket and said second bracket, said ramp configured to facilitate movement of said cabinet.

22. (NEW) The system of claim 10, wherein at least one of said first bracket and said second bracket is configured with a ramp, said ramp configured to extend over a tailgate of said vehicle bed to facilitate movement of said cabinet over said tailgate.

23. (NEW) The system of claim 10, wherein at least one of said first bracket and said second bracket is configured with a ramp, said ramp configured to extend over a groove within said vehicle bed to facilitate movement of said cabinet over said groove.

24. (NEW) The system of claim 10, wherein said storage area comprises at least one removable divider having a hand hold to facilitate lifting of said divider.



25. (NEW) The system of claim 10, wherein said storage area comprises at least one removable compartment having a hand hold to facilitate lifting of said removable compartment.

26. (NEW) The system of claim 10, wherein a side surface of said cabinet comprises at least one drawer slidably mounted to said side surface of said cabinet.

27. (NEW) The system of claim 10, further comprising at least one wheel mounted to said cabinet, wherein said one wheel includes at least one of a caster wheel, a fully articulating caster wheel, and locking mechanism.

28. (NEW) The system of claim 10, further comprising a locking mechanism configured to selectively restrict said cabinet movement along said first and said second bracket.

29. (NEW) The system of claim 10, wherein said adjustable height device comprises at least one of a cylinder system, pneumatic system, screw mechanism, guide rod and height adjustment actuator.

[0060] ~~1. A vehicle mounted storage unit capable of being mounted to a floor portion of a vehicle having juxtaposed side panels, a wheel well extending outwardly from each side panel by a first distance, a vehicle surface that is perpendicular to said side panels, said vehicle surface being spaced from the rearmost portion of said wheel wells by a second distance, said vehicle surface being movable as the inner surface of a tailgate, said vehicle mounted storage unit comprising:~~

~~2. a mounting bracket fixed to each said floor portion of said vehicle, said mounting brackets having a width that is not greater than first distance, said mounting brackets having a length that is not greater than second distance, said mounting brackets having a height that is not greater than the height of said side panels, said mounting brackets being fixed to each said floor portion of said vehicle at mounting points adjacent to said sidewalls of said vehicle and between said wheel wells and said vehicle surface, said mounting brackets having a rigid retaining ear that prevents forward motion of said storage unit;~~

~~3. a cabinet capable of being fixed to said floor portion of said vehicle at said mounting points, said cabinet having a length, width, and height, said length of said cabinet being no greater than the width of said tailgate, said width of said cabinet being no greater than second dimension, said height of said cabinet being no greater than height of said side panels, said cabinet containing a main storage area and two sliding drawers laterally mounted in the lower portion of said cabinet, said cabinet having pivotally attached access doors on the front;~~

~~4. a slide mechanism that facilitates attachment of said cabinet to said mounting brackets and movement of said cabinet orthogonally to said mounting brackets, said slide mechanism containing a quick release mechanism that facilitates rapid release and reattachment of said cabinet to said mounting brackets;~~

~~5. a slide locking mechanism that facilitates locking of said cabinet to said rails and said mounting brackets in a fixed position, said locking mechanism simultaneously locks \_\_\_\_\_ said \_\_\_\_\_ sliding \_\_\_\_\_ drawers;~~

~~6. a gas cylinder mechanism that facilitates raising and lowering said cabinet, said mechanism being securely attached to said cabinet, said mechanism being fully enclosed in said cabinet, said mechanism having readily accessible actuators, said mechanism capable of raising said cabinet above its locked height, said mechanism capable of operating when said cabinet is dismounted from vehicle, said mechanism capable of operating when said cabinet is mounted in vehicle;~~

~~7. a wheel platform that facilitates rolling of said cabinet, said platform being securely attached to said bottom of gas cylinder mechanism, said wheel platform having a plurality of wheels on its lower surface, said wheels protruding below the lower surface of said cabinet when said gas cylinder mechanism is fully retracted;~~

~~8. a safety belt mechanism that prevents sudden movement of said cabinet, said mechanism comprising a belt retractor securely attached to one of said mounting brackets, said mechanism having a quick release mechanism securely attached to the opposing mounting bracket, said safety belt being attached to said cabinet on the \_\_\_\_\_ rear \_\_\_\_\_ surface;~~

~~9. an upper surface lid that facilitates workbench functions, said upper surface being pivotally attached to said cabinet, said upper surface extending over the sides of said cabinet within the width limitations of said tailgate, said upper surface containing measurement and alignment aids, said upper surface containing handholds to facilitate movement of said cabinet, said lid having a front lip that covers the upper front portion of said cabinet and prevents said hinged access doors \_\_\_\_\_ from \_\_\_\_\_ opening \_\_\_\_\_ when \_\_\_\_\_ said \_\_\_\_\_ lid \_\_\_\_\_ is \_\_\_\_\_ closed;~~

### ABSTRACT

ABSTRACT:—An improved vehicle mounted storage unit and workbench, comprising a variably configured cabinet, upper lid with workbench surface, mechanisms for varying the cabinet's working height, slides and wheels for moving the cabinet, mounting brackets to fix the unit to a floor portion of a vehicle. The slides allow the cabinet to slide in and out of the mounting brackets, and contain a quick release feature allowing the unit to be dismounted from them and the vehicle without using tools. ~~The cabinet has mechanisms that lock it to the slides and mounting brackets; preventing cabinet access. The cabinet also contains mechanisms that variably raise and lower it above attached wheels, facilitating its movement and configuration as a portable workbench or storage unit. The cabinet has a variety of internal arrangements and an upper lid that extends over the sides of the cabinet, providing a workbench surface with measurement and alignment aids.~~

**9 Claims, 8 Drawing Sheets**

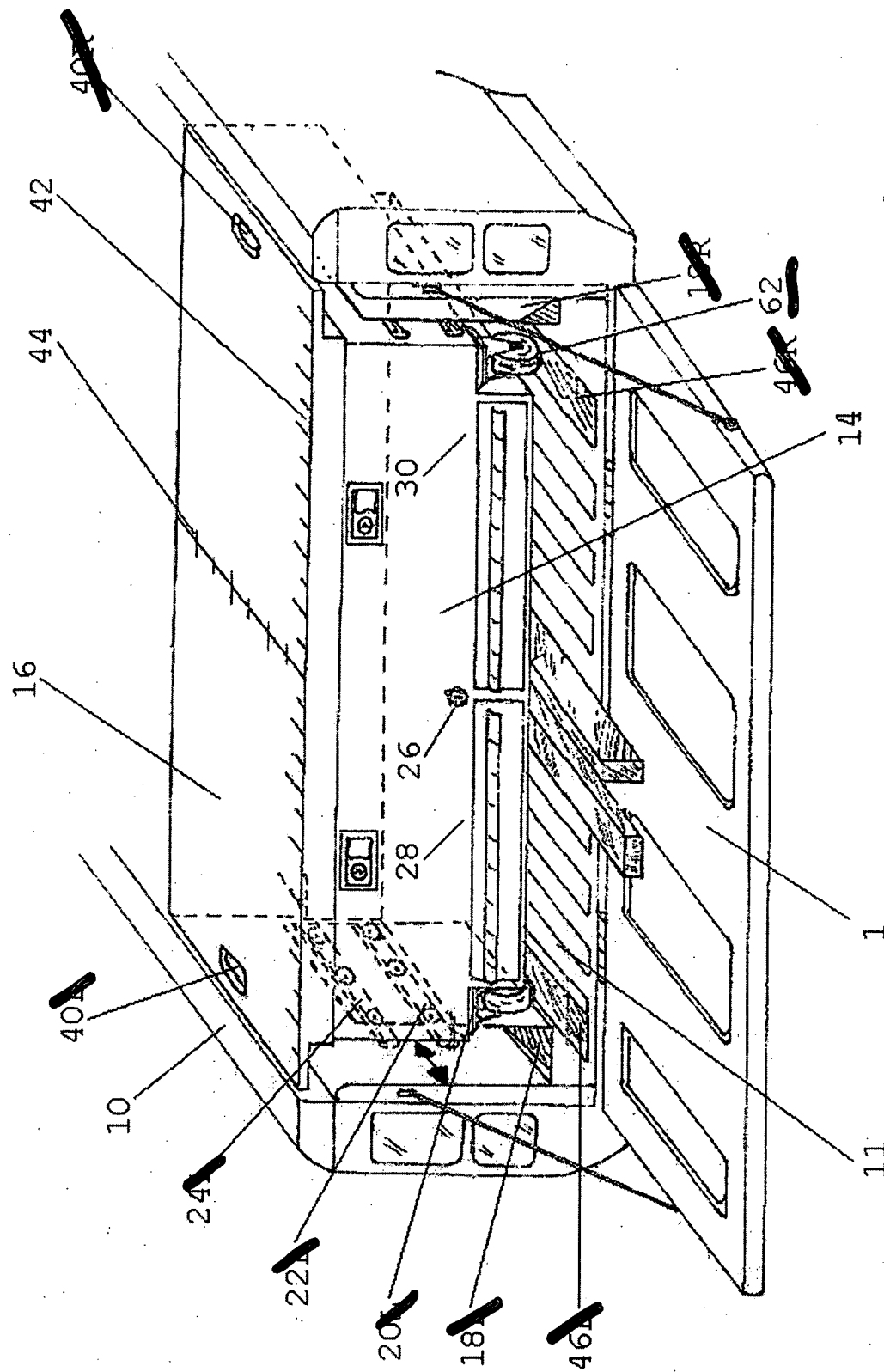


Figure 1

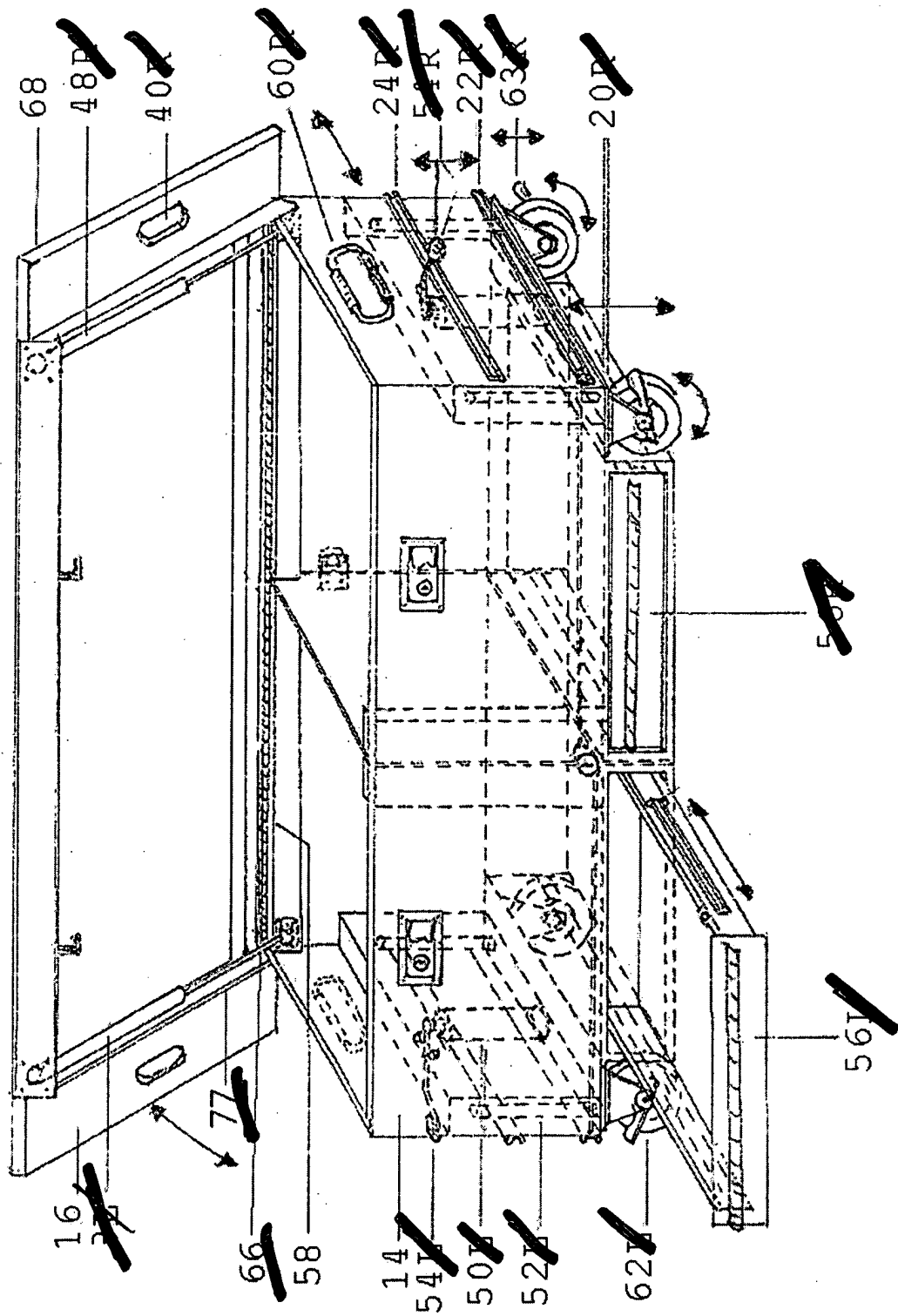


Figure 2

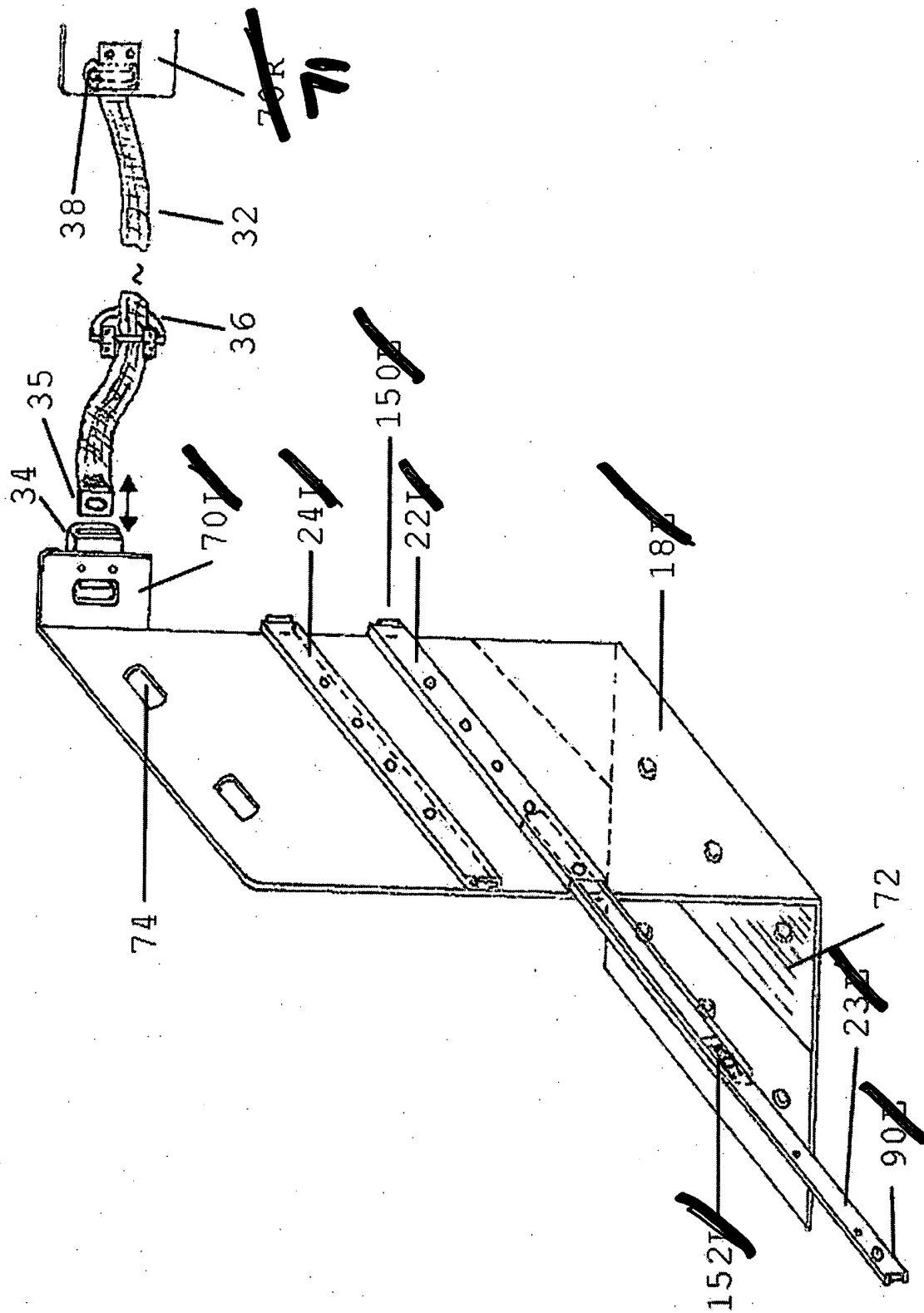


Figure 3

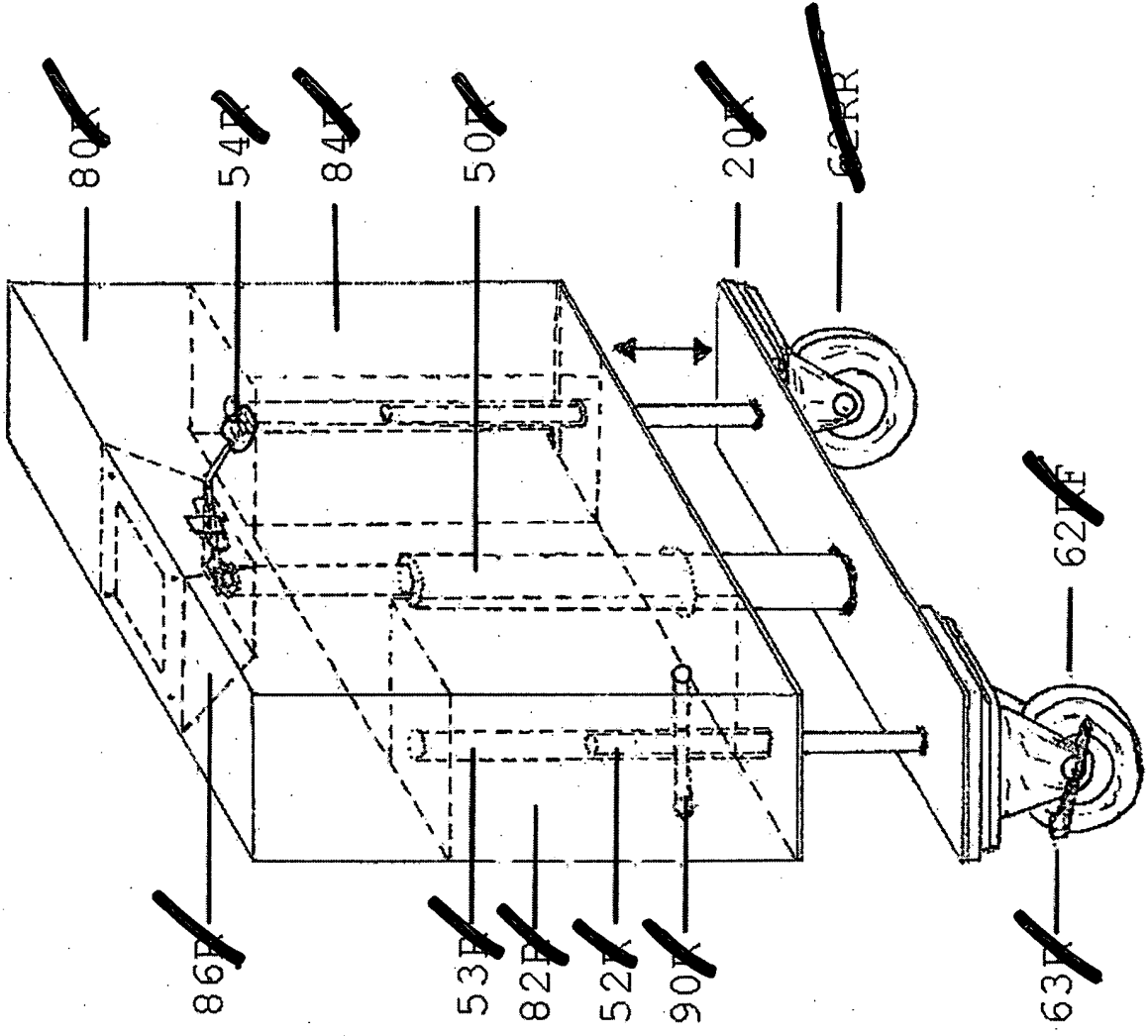


Figure 4



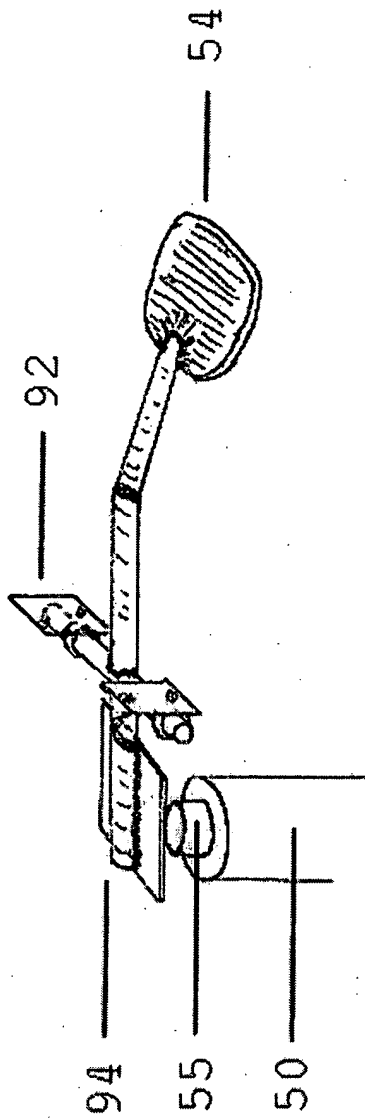


Figure 5

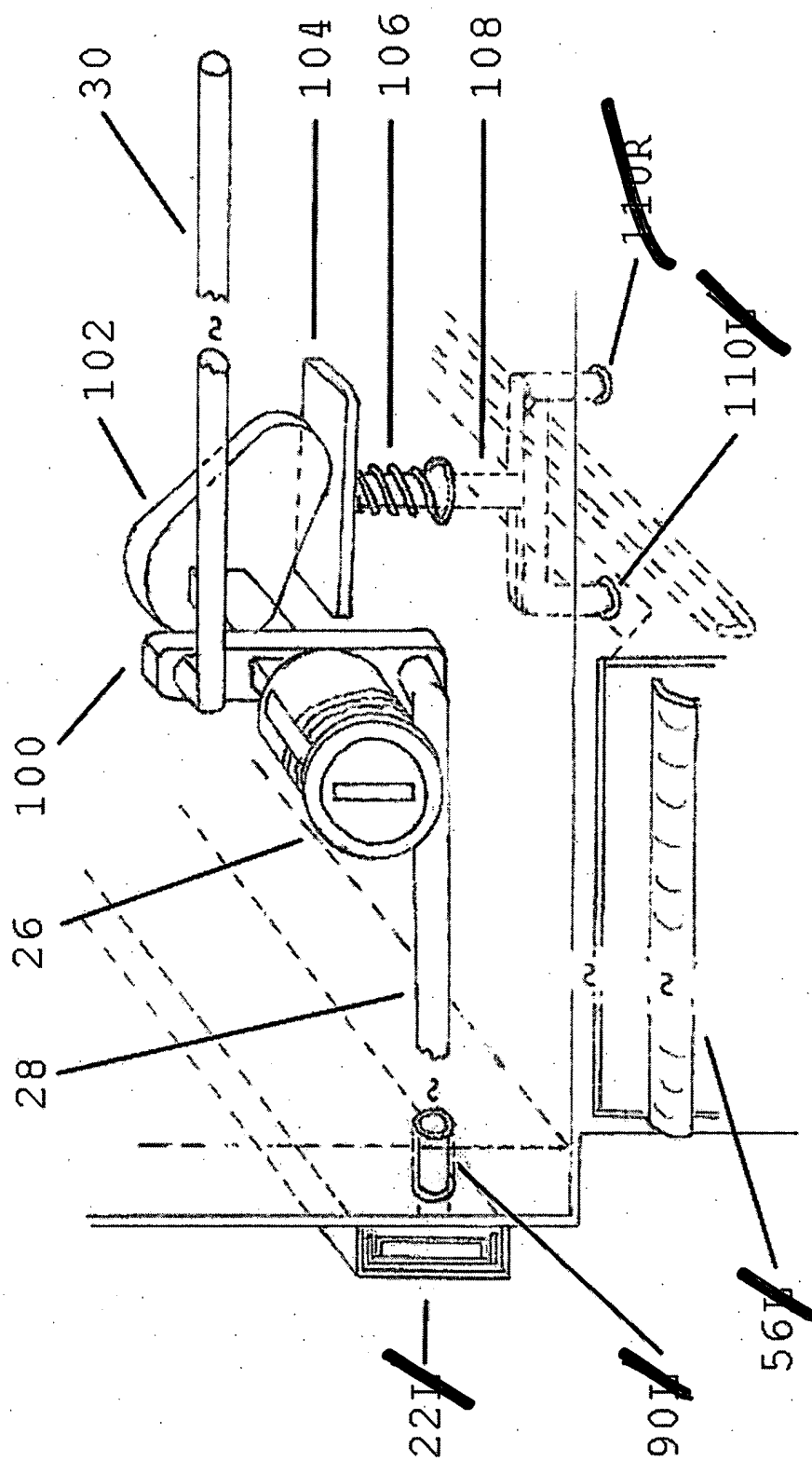


Figure 6

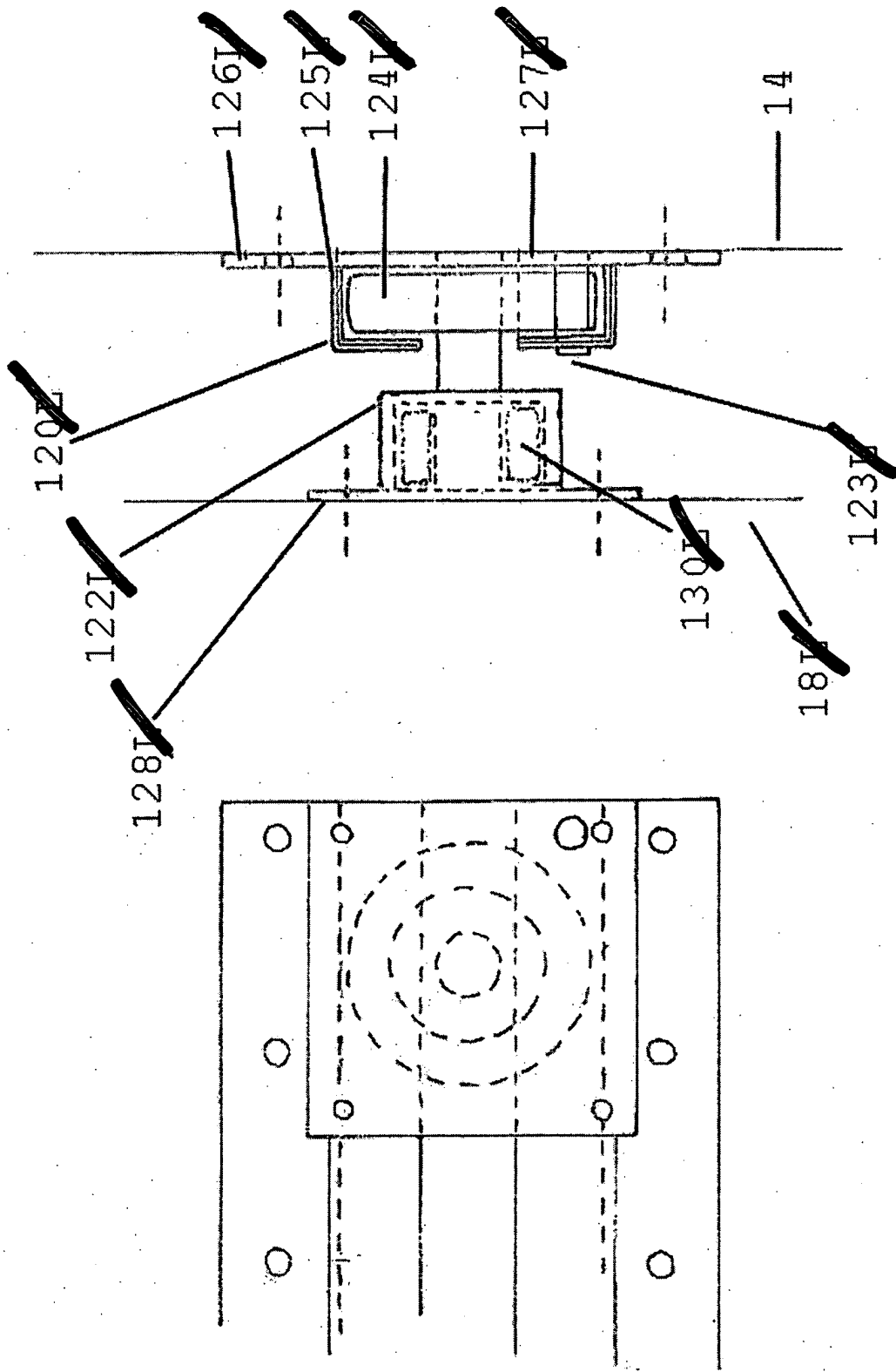


Figure 7A

Figure 7B

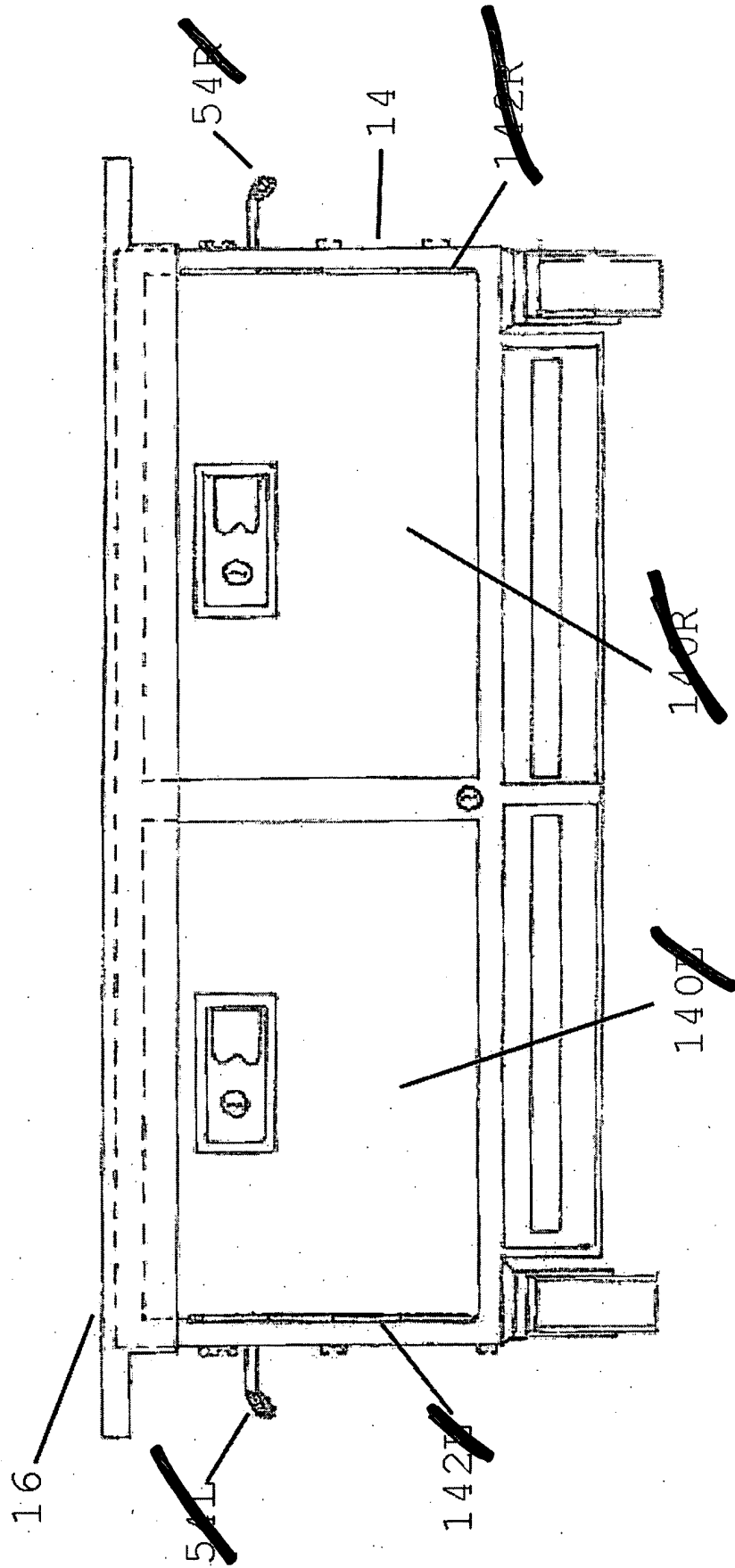


Figure 8